

section to the Administrator in accordance with § 600.314.

(d) For those model types created under § 600.208-12(a)(2), the manufacturer shall submit fuel economy and carbon-related exhaust emissions data for each subconfiguration added by a running change.

[75 FR 25713, May 7, 2010, as amended at 76 FR 39567, July 6, 2011]

**§ 600.509-12 Voluntary submission of additional data.**

(a) The manufacturer may optionally submit data in addition to the data required by the Administrator.

(b) Additional fuel economy and carbon-related exhaust emissions data may be submitted by the manufacturer for any vehicle configuration which is to be tested as required in § 600.507 or for which fuel economy and carbon-related exhaust emissions data were previously submitted under paragraph (c) of this section.

(c) Within a base level, additional fuel economy and carbon-related exhaust emissions data may be submitted by the manufacturer for any vehicle configuration which is not required to be tested by § 600.507.

[75 FR 25713, May 7, 2010]

**§ 600.510-12 Calculation of average fuel economy and average carbon-related exhaust emissions.**

(a)(1) Average fuel economy will be calculated to the nearest 0.1 mpg for the categories of automobiles identified in this section, and the results of such calculations will be reported to the Secretary of Transportation for use in determining compliance with the applicable fuel economy standards.

(i) An average fuel economy calculation will be made for the category of passenger automobiles as determined by the Secretary of Transportation. For example, categories may include, but are not limited to domestically manufactured and/or non-domestically manufactured passenger automobiles as determined by the Secretary of Transportation.

(ii) [Reserved]

(iii) An average fuel economy calculation will be made for the category of trucks as determined by the Secretary of Transportation. For example,

categories may include, but are not limited to domestically manufactured trucks, non-domestically manufactured trucks, light-duty trucks, medium-duty passenger vehicles, and/or heavy-duty trucks as determined by the Secretary of Transportation.

(iv) [Reserved]

(2) Average carbon-related exhaust emissions will be calculated to the nearest one gram per mile for the categories of automobiles identified in this section, and the results of such calculations will be reported to the Administrator for use in determining compliance with the applicable CO<sub>2</sub> emission standards.

(i) An average carbon-related exhaust emissions calculation will be made for passenger automobiles.

(ii) An average carbon-related exhaust emissions calculation will be made for light trucks.

(b) For the purpose of calculating average fuel economy under paragraph (c) of this section and for the purpose of calculating average carbon-related exhaust emissions under paragraph (j) of this section:

(1) All fuel economy and carbon-related exhaust emissions data submitted in accordance with § 600.006(e) or § 600.512(c) shall be used.

(2) The combined city/highway fuel economy and carbon-related exhaust emission values will be calculated for each model type in accordance with § 600.208 except that:

(i) Separate fuel economy values will be calculated for model types and base levels associated with car lines for each category of passenger automobiles and light trucks as determined by the Secretary of Transportation pursuant to paragraph (a)(1) of this section.

(ii) Total model year production data, as required by this subpart, will be used instead of sales projections;

(iii) [Reserved]

(iv) The fuel economy value will be rounded to the nearest 0.1 mpg;

(v) The carbon-related exhaust emission value will be rounded to the nearest gram per mile; and

(vi) At the manufacturer's option, those vehicle configurations that are self-compensating to altitude changes

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may be separated by sales into high-altitude sales categories and low-altitude sales categories. These separate sales categories may then be treated (only for the purpose of this section) as separate configurations in accordance with the procedure of § 600.208-12(a)(4)(ii).

(3) The fuel economy and carbon-related exhaust emission values for each vehicle configuration are the combined fuel economy and carbon-related exhaust emissions calculated according to § 600.206-12(a)(3) except that:

(i) Separate fuel economy values will be calculated for vehicle configurations associated with car lines for each category of passenger automobiles and light trucks as determined by the Secretary of Transportation pursuant to paragraph (a)(1) of this section.

(ii) Total model year production data, as required by this subpart will be used instead of sales projections; and

(iii) [Reserved]

(4) Emergency vehicles may be excluded from the fleet average carbon-related exhaust emission calculations

described in paragraph (j) of this section. The manufacturer should notify the Administrator that they are making such an election in the model year reports required under § 600.512 of this chapter. Such vehicles should be excluded from both the calculation of the fleet average standard for a manufacturer under 40 CFR 86.1818-12(c)(4) and from the calculation of the fleet average carbon-related exhaust emissions in paragraph (j) of this section.

(c)(1) Average fuel economy shall be calculated as follows:

(i) Except as allowed in paragraph (d) of this section, the average fuel economy for the model years before 2017 will be calculated individually for each category identified in paragraph (a)(1) of this according to the provisions of paragraph (c)(2) of this section.

(ii) Except as permitted in paragraph (d) of this section, the average fuel economy for the 2017 and later model years will be calculated individually for each category identified in paragraph (a)(1) of this section using the following equation:

$$\text{Average MPG} = \frac{1}{\left[ \frac{1}{\text{MPG}} - (\text{FCIV}_{\text{AC}} + \text{FCIV}_{\text{OC}} + \text{FCIV}_{\text{PU}}) \right]}$$

Where:

Average MPG = the fleet average fuel economy for a category of vehicles;

MPG = the average fuel economy for a category of vehicles determined according to paragraph (c)(2) of this section;

$\text{FCIV}_{\text{AC}}$  = Air conditioning fuel economy credits for a category of vehicles, in gallons per mile, determined according to paragraph (c)(3)(i) of this section;

$\text{FCIV}_{\text{OC}}$  = Off-cycle technology fuel economy credits for a category of vehicles, in gallons per mile, determined according to paragraph (c)(3)(ii) of this section; and

$\text{FCIV}_{\text{PU}}$  = Pickup truck fuel economy credits for the light truck category, in gallons per mile, determined according to paragraph (c)(3)(iii) of this section.

(2) Divide the total production volume of that category of automobiles by a sum of terms, each of which corresponds to a model type within that category of automobiles and is a fraction determined by dividing the num-

ber of automobiles of that model type produced by the manufacturer in the model year by:

(i) For gasoline-fueled and diesel-fueled model types, the fuel economy calculated for that model type in accordance with paragraph (b)(2) of this section; or

(ii) For alcohol-fueled model types, the fuel economy value calculated for that model type in accordance with paragraph (b)(2) of this section divided by 0.15 and rounded to the nearest 0.1 mpg; or

(iii) For natural gas-fueled model types, the fuel economy value calculated for that model type in accordance with paragraph (b)(2) of this section divided by 0.15 and rounded to the nearest 0.1 mpg; or

(iv) For alcohol dual fuel model types, for model years 1993 through

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2019, the harmonic average of the following two terms; the result rounded to the nearest 0.1 mpg:

(A) The combined model type fuel economy value for operation on gasoline or diesel fuel as determined in § 600.208-12(b)(5)(i); and

(B) The combined model type fuel economy value for operation on alcohol fuel as determined in § 600.208-

12(b)(5)(ii) divided by 0.15 provided the requirements of paragraph (g) of this section are met; or

(v) For alcohol dual fuel model types, for model years after 2019, the combined model type fuel economy determined according to the following equation and rounded to the nearest 0.1 mpg:

$$MPG = \left( \frac{F}{MPG_A} + \frac{(1 - F)}{MPG_G} \right)^{-1}$$

Where:

F = 0.00 unless otherwise approved by the Administrator according to the provisions of paragraph (k) of this section;

MPG<sub>A</sub> = The combined model type fuel economy for operation on alcohol fuel as determined in § 600.208-12(b)(5)(ii) divided by 0.15 provided the requirements of paragraph (g) of this section are met; and

MPG<sub>G</sub> = The combined model type fuel economy for operation on gasoline or diesel fuel as determined in § 600.208-12(b)(5)(i).

(vi) For natural gas dual fuel model types, for model years 1993 through 2019, the harmonic average of the following two terms; the result rounded to the nearest 0.1 mpg:

(A) The combined model type fuel economy value for operation on gasoline or diesel as determined in § 600.208-12(b)(5)(i); and

(B) The combined model type fuel economy value for operation on natural gas as determined in § 600.208-12(b)(5)(ii) divided by 0.15 provided the requirements of paragraph (g) of this section are met; or

(vii)(A) For natural gas dual fuel model types, for model years after 2019, the combined model type fuel economy determined according to the following formula and rounded to the nearest 0.1 mpg:

$$MPG = \left( \frac{UF}{MPG_{CNG}} + \frac{(1 - UF)}{MPG_G} \right)^{-1}$$

Where:

MPG<sub>CNG</sub> = The combined model type fuel economy for operation on natural gas as determined in § 600.208-12(b)(5)(ii) divided by 0.15 provided the requirements of paragraph (g) of this section are met; and

MPG<sub>G</sub> = The combined model type fuel economy for operation on gasoline or diesel fuel as determined in § 600.208-12(b)(5)(i).

UF = A Utility Factor (UF) value selected from the following table based on the driving range of the vehicle while operating on natural gas, except for natural gas dual fuel vehicles that do not meet the criteria in paragraph (c)(2)(vii)(B) the Utility Factor shall be 0.5. Determine the vehicle's driving range in miles by multiplying the combined fuel economy as de-

termined in § 600.208-12(b)(5)(ii) by the vehicle's usable fuel storage capacity (as defined at § 600.002 and expressed in gasoline gallon equivalents), and rounding to the nearest 10 miles.

Driving range (miles)	UF
10	0.228
20	0.397
30	0.523
40	0.617
50	0.689
60	0.743
70	0.785
80	0.818
90	0.844
100	0.865
110	0.882

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Driving range (miles)	UF
120	0.896
130	0.907
140	0.917
150	0.925
160	0.932
170	0.939
180	0.944
190	0.949
200	0.954
210	0.958
220	0.962
230	0.965
240	0.968
250	0.971
260	0.973
270	0.976
280	0.978
290	0.980
300	0.981

(B) Natural gas dual fuel model types must meet the following criteria to

qualify for use of a Utility Factor greater than 0.5:

(1) The driving range using natural gas must be at least two times the driving range using gasoline.

(2) The natural gas dual fuel vehicle must be designed such that gasoline is used only when the natural gas tank is effectively empty, except for limited use of gasoline that may be required to initiate combustion.

(3) *Fuel consumption improvement.* Calculate the separate air conditioning, off-cycle, and pickup truck fuel consumption improvement as follows:

(i) Air conditioning fuel consumption improvement values are calculated separately for each category identified in paragraph (a)(1) of this section using the following equation:

$$FCIV_{AC} \text{ (gal/mi)} = \frac{(ACCredit \times 1,000,000)}{(VLM \times Production \times 8887)}$$

Where:

$FCIV_{AC}$  = the fleet production-weighted total value of air conditioning efficiency credits (fuel consumption improvement value) for all air conditioning systems in the applicable fleet, expressed in gallons per mile;

$ACCredit$  = the total of all air conditioning efficiency credits for the applicable vehicle category, in megagrams, from 40 CFR 86.1868-12(c), and rounded to the nearest whole number;

VLM = vehicle lifetime miles, which for passenger automobiles shall be 195,264 and for light trucks shall be 225,865; and

Production = the total production volume for the applicable category of vehicles.

(ii) Off-cycle technology fuel consumption improvement values are calculated separately for each category identified in paragraph (a)(1) of this section using the following equation:

$$FCIV_{OC} \text{ (gal/mi)} = \frac{(OCCredit \times 1,000,000)}{(VLM \times Production \times 8887)}$$

Where:

$FCIV_{OC}$  = the fleet production-weighted total value of off-cycle technology credits (fuel consumption improvement value) for all off-cycle technologies in the applicable fleet, expressed in gallons per mile;

$OCCredit$  = the total of all off-cycle technology credits for the applicable vehicle category, in megagrams, from 40 CFR 86.1869-12(e), and rounded to the nearest whole number;

VLM = vehicle lifetime miles, which for passenger automobiles shall be 195,264 and for light trucks shall be 225,865; and

Production = the total production volume for the applicable category of vehicles.

(iii) Full size pickup truck fuel consumption improvement values are calculated for the light truck category identified in paragraph (a)(1) of this section using the following equation:

$$FCIV_{PU} \text{ (gal/mi)} = \frac{(PUCredit \times 1,000,000)}{(225,865 \times Production \times 8887)}$$

Where:

$FCIV_{PU}$  = the fleet production-weighted total value of full size pickup truck credits (fuel consumption improvement value) for the light truck fleet, expressed in gallons per mile;

$PUCredit$  = the total of all full size pickup truck credits, in megagrams, from 40 CFR 86.1870-12(c), and rounded to the nearest whole number; and

$Production$  = the total production volume for the light truck category.

(d) The Administrator may approve alternative calculation methods if they are part of an approved credit plan under the provisions of 15 U.S.C. 2003.

(e) For passenger automobile categories identified in paragraph (a)(1) of this section, the average fuel economy calculated in accordance with paragraph (c) of this section shall be adjusted using the following equation:

$$AFE_{adj} = AFE[(0.55 \times a \times c) + (0.45 \times c) + (0.5556 \times a) + 0.4487] / [(0.55 \times a) + 0.45] + IW$$

Where:

$AFE_{adj}$  = Adjusted average combined fuel economy, rounded to the nearest 0.1 mpg;

$AFE$  = Average combined fuel economy as calculated in paragraph (c) of this section, rounded to the nearest 0.0001 mpg;

$a$  = Sales-weight average (rounded to the nearest 0.0001 mpg) of all model type highway fuel economy values (rounded to the nearest 0.1 mpg) divided by the sales-weighted average (rounded to the nearest 0.0001 mpg) of all model type city fuel economy values (rounded to the nearest 0.1 mpg). The quotient shall be rounded to 4 decimal places. These average fuel economies shall be determined using the methodology of paragraph (c) of this section.

$c$  = 0.0014;

$IW = (9.2917 \times 10^{-3} \times SF_{3IWC} \times FE_{3IWC}) - (3.5123 \times 10^{-3} \times SF_{4ETW} \times FE_{4IWC})$ .

NOTE: Any calculated value of  $IW$  less than zero shall be set equal to zero.

$SF_{3IWC}$  = The 3000 lb. inertia weight class sales divided by total sales. The quotient shall be rounded to 4 decimal places.

$SF_{4ETW}$  = The 4000 lb. equivalent test weight category sales divided by total sales. The quotient shall be rounded to 4 decimal places.

$FE_{4IWC}$  = The sales-weighted average combined fuel economy of all 3000 lb. inertia

weight class base levels in the compliance category. Round the result to the nearest 0.0001 mpg.

$FE_{4IWC}$  = The sales-weighted average combined fuel economy of all 4000 lb. inertia weight class base levels in the compliance category. Round the result to the nearest 0.0001 mpg.

(f) The Administrator shall calculate and apply additional average fuel economy adjustments if, after notice and opportunity for comment, the Administrator determines that, as a result of test procedure changes not previously considered, such correction is necessary to yield fuel economy test results that are comparable to those obtained under the 1975 test procedures. In making such determinations, the Administrator must find that:

(1) A directional change in measured fuel economy of an average vehicle can be predicted from a revision to the test procedures;

(2) The magnitude of the change in measured fuel economy for any vehicle or fleet of vehicles caused by a revision to the test procedures is quantifiable from theoretical calculations or best available test data;

(3) The impact of a change on average fuel economy is not due to eliminating the ability of manufacturers to take advantage of flexibility within the existing test procedures to gain measured improvements in fuel economy which are not the result of actual improvements in the fuel economy of production vehicles;

(4) The impact of a change on average fuel economy is not solely due to a greater ability of manufacturers to reflect in average fuel economy those design changes expected to have comparable effects on in-use fuel economy;

(5) The test procedure change is required by EPA or is a change initiated by EPA in its laboratory and is not a change implemented solely by a manufacturer in its own laboratory.

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(g)(1) Dual fuel automobiles must provide equal or greater energy efficiency while operating on the alternative fuel as while operating on gasoline or diesel fuel to obtain the CAFE credit determined in paragraphs (c)(2)(iv) and (v) of this section or to obtain the carbon-related exhaust emissions credit determined in paragraphs (j)(2)(ii) and (iii) of this section. The following equation must hold true:

$$E_{alt}/E_{pet} \geq 1$$

Where:

$E_{alt}$  =  $[FE_{alt}/(NHV_{alt} \times D_{alt})] \times 10^6$  = energy efficiency while operating on alternative fuel rounded to the nearest 0.01 miles/million BTU.

$E_{pet}$  =  $[FE_{pet}/(NHV_{pet} \times D_{pet})] \times 10^6$  = energy efficiency while operating on gasoline or diesel (petroleum) fuel rounded to the nearest 0.01 miles/million BTU.

$FE_{alt}$  is the fuel economy [miles/gallon for liquid fuels or miles/100 standard cubic feet for gaseous fuels] while operated on the alternative fuel as determined in § 600.113-12(a) and (b).

$FE_{pet}$  is the fuel economy [miles/gallon] while operated on petroleum fuel (gasoline or diesel) as determined in § 600.113-12(a) and (b).

$NHV_{alt}$  is the net (lower) heating value [BTU/lb] of the alternative fuel.

$NHV_{pet}$  is the net (lower) heating value [BTU/lb] of the petroleum fuel.

$D_{alt}$  is the density [lb/gallon for liquid fuels or lb/100 standard cubic feet for gaseous fuels] of the alternative fuel.

$D_{pet}$  is the density [lb/gallon] of the petroleum fuel.

(i) The equation must hold true for both the FTP city and HFET highway fuel economy values for each test of each test vehicle.

(ii)(A) The net heating value for alcohol fuels shall be premeasured using a test method which has been approved in advance by the Administrator.

(B) The density for alcohol fuels shall be premeasured using ASTM D 1298 (incorporated by reference at § 600.011).

(iii) The net heating value and density of gasoline are to be determined by the manufacturer in accordance with § 600.113.

(2) [Reserved]

(3) Dual fuel passenger automobiles manufactured during model years 1993 through 2019 must meet the minimum

driving range requirements established by the Secretary of Transportation (49 CFR part 538) to obtain the CAFE credit determined in paragraphs (c)(2)(iv) and (v) of this section.

(h) For model years 1993 and later, and for each category of automobile identified in paragraph (a)(1) of this section, the maximum increase in average fuel economy determined in paragraph (c) of this section attributable to dual fuel automobiles, except where the alternative fuel is electricity, shall be as follows:

Model year	Maximum increase (mpg)
1993-2014 .....	1.2
2015 .....	1.0
2016 .....	0.8
2017 .....	0.6
2018 .....	0.4
2019 .....	0.2
2020 and later .....	0.0

(1) The Administrator shall calculate the increase in average fuel economy to determine if the maximum increase provided in paragraph (h) of this section has been reached. The Administrator shall calculate the average fuel economy for each category of automobiles specified in paragraph (a)(1) of this section by subtracting the average fuel economy values calculated in accordance with this section by assuming all alcohol dual fuel and natural gas dual fuel automobiles are operated exclusively on gasoline (or diesel) fuel from the average fuel economy values determined in paragraph (c) of this section. The difference is limited to the maximum increase specified in paragraph (h) of this section.

(2) [Reserved]

(i) For model years 2012 through 2015, and for each category of automobile identified in paragraph (a)(1) of this section, the maximum decrease in average carbon-related exhaust emissions determined in paragraph (j) of this section attributable to alcohol dual fuel automobiles and natural gas dual fuel automobiles shall be calculated using the following formula, and rounded to the nearest tenth of a gram per mile:

$$\text{Maximum Decrease} = \frac{8887}{\left[ \frac{8887}{\text{FltAvg}} - \text{MPG}_{\text{MAX}} \right]} - \text{FltAvg}$$

Where:

**FltAvg** = The fleet average CREE value in grams per mile, rounded to the nearest whole number, for passenger automobiles or light trucks determined for the applicable model year according to paragraph (j) of this section, except by assuming all alcohol dual fuel and natural gas dual fuel automobiles are operated exclusively on gasoline (or diesel) fuel. For the purposes of these calculations, the values for natural gas dual fuel automobiles using the optional Utility Factor approach in paragraph (j)(2)(vii) of this section shall not be the gasoline CREE values, but the CREE values determined in paragraph (j)(2)(vii) of this section.

**MPG<sub>MAX</sub>** = The maximum increase in miles per gallon determined for the appropriate model year in paragraph (h) of this section.

(1) The Administrator shall calculate the decrease in average carbon-related exhaust emissions to determine if the maximum decrease provided in this paragraph (i) has been reached. The Administrator shall calculate the average carbon-related exhaust emissions for each category of automobiles specified in paragraph (a) of this section by subtracting the average carbon-related exhaust emission values determined in paragraph (j) of this section from the average carbon-related exhaust emission values calculated in accordance with this section by assuming all alcohol dual fuel and natural gas dual fuel automobiles are operated exclusively on gasoline (or diesel) fuel. For the purposes of these calculations, the values for natural gas dual fuel automobiles using the optional Utility Factor approach in paragraph (j)(2)(vii) of this section shall not be the gasoline CREE values, but the CREE values determined in paragraph (j)(2)(vii) of this section. The difference is limited to the maximum decrease specified in paragraph (i) of this section.

(2) [Reserved]

(j) The average carbon-related exhaust emissions will be calculated individually for each category identified in

paragraph (a)(1) of this section as follows:

(1) Divide the total production volume of that category of automobiles into:

(2) A sum of terms, each of which corresponds to a model type within that category of automobiles and is a product determined by multiplying the number of automobiles of that model type produced by the manufacturer in the model year by:

(i) For gasoline-fueled and diesel-fueled model types, the carbon-related exhaust emissions value calculated for that model type in accordance with paragraph (b)(2) of this section; or

(ii)(A) For alcohol-fueled model types, for model years 2012 through 2015, the carbon-related exhaust emissions value calculated for that model type in accordance with paragraph (b)(2) of this section multiplied by 0.15 and rounded to the nearest gram per mile, except that manufacturers complying with the fleet averaging option for N<sub>2</sub>O and CH<sub>4</sub> as allowed under § 86.1818 of this chapter must perform this calculation such that N<sub>2</sub>O and CH<sub>4</sub> values are not multiplied by 0.15; or

(B) For alcohol-fueled model types, for model years 2016 and later, the carbon-related exhaust emissions value calculated for that model type in accordance with paragraph (b)(2) of this section; or

(iii)(A) For natural gas-fueled model types, for model years 2012 through 2015, the carbon-related exhaust emissions value calculated for that model type in accordance with paragraph (b)(2) of this section multiplied by 0.15 and rounded to the nearest gram per mile, except that manufacturers complying with the fleet averaging option for N<sub>2</sub>O and CH<sub>4</sub> as allowed under § 86.1818 of this chapter must perform this calculation such that N<sub>2</sub>O and CH<sub>4</sub> values are not multiplied by 0.15; or

(B) For natural gas-fueled model types, for model years 2016 and later, the carbon-related exhaust emissions

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value calculated for that model type in accordance with paragraph (b)(2) of this section; or

(iv) For alcohol dual fuel model types, for model years 2012 through 2015, the arithmetic average of the following two terms, the result rounded to the nearest gram per mile:

(A) The combined model type carbon-related exhaust emissions value for operation on gasoline or diesel fuel as determined in § 600.208-12(b)(5)(i); and

(B) The combined model type carbon-related exhaust emissions value for operation on alcohol fuel as determined in § 600.208-12(b)(5)(ii) multiplied by 0.15 provided the requirements of paragraph (g) of this section are met, except that manufacturers complying with the fleet averaging option for N<sub>2</sub>O and CH<sub>4</sub> as allowed under § 86.1818 of this chapter must perform this calculation such that N<sub>2</sub>O and CH<sub>4</sub> values are not multiplied by 0.15; or

(v) For natural gas dual fuel model types, for model years 2012 through 2015, the arithmetic average of the following two terms; the result rounded to the nearest gram per mile:

(A) The combined model type carbon-related exhaust emissions value for operation on gasoline or diesel as determined in § 600.208-12(b)(5)(i); and

(B) The combined model type carbon-related exhaust emissions value for operation on natural gas as determined in § 600.208-12(b)(5)(ii) multiplied by 0.15

provided the requirements of paragraph (g) of this section are met, except that manufacturers complying with the fleet averaging option for N<sub>2</sub>O and CH<sub>4</sub> as allowed under § 86.1818 of this chapter must perform this calculation such that N<sub>2</sub>O and CH<sub>4</sub> values are not multiplied by 0.15.

(vi) For alcohol dual fuel model types, for model years 2016 and later, the combined model type carbon-related exhaust emissions value determined according to the following formula and rounded to the nearest gram per mile:

$$CREE = (F \times CREE_{alt}) + ((1 - F) \times CREE_{gas})$$

Where:

F = 0.00 unless otherwise approved by the Administrator according to the provisions of paragraph (k) of this section;

CREE<sub>alt</sub> = The combined model type carbon-related exhaust emissions value for operation on alcohol fuel as determined in § 600.208-12(b)(5)(ii); and

CREE<sub>gas</sub> = The combined model type carbon-related exhaust emissions value for operation on gasoline or diesel fuel as determined in § 600.208-12(b)(5)(i).

(vii)(A) For natural gas dual fuel model types, for model years 2016 and later, or optionally for model years 2012 through 2015, the combined model type carbon-related exhaust emissions value determined according to the following formula and rounded to the nearest gram per mile:

$$CREE = [CREE_{CNG} \times UF] + [CREE_{GAS} \times (1 - UF)]$$

Where:

CREE<sub>CNG</sub> = The combined model type carbon-related exhaust emissions value for operation on natural gas as determined in § 600.208-12(b)(5)(ii); and

CREE<sub>GAS</sub> = The combined model type carbon-related exhaust emissions value for operation on gasoline or diesel fuel as determined in § 600.208-12(b)(5)(i).

UF = A Utility Factor (UF) value selected from the following table based on the driving range of the vehicle while operating on natural gas, except for natural gas dual fuel vehicles that do not meet the criteria in paragraph (j)(2)(vii)(B) the Utility Factor shall be 0.5. Determine the vehicle's driving range in miles by multiplying the combined fuel economy as de-

termined in § 600.208-12(b)(5)(ii) by the vehicle's usable fuel storage capacity (as defined at § 600.002 and expressed in gasoline gallon equivalents), and rounding to the nearest 10 miles.

Driving range (miles)	UF
10	0.228
20	0.397
30	0.523
40	0.617
50	0.689
60	0.743
70	0.785
80	0.818
90	0.844
100	0.865
110	0.882



Driving range (miles)	UF
120	0.896
130	0.907
140	0.917
150	0.925
160	0.932
170	0.939
180	0.944
190	0.949
200	0.954
210	0.958
220	0.962
230	0.965
240	0.968
250	0.971
260	0.973
270	0.976
280	0.978
290	0.980
300	0.981

(B) Natural gas dual fuel model types must meet the following criteria to qualify for use of a Utility Factor greater than 0.5:

(1) The driving range using natural gas must be at least two times the driving range using gasoline.

(2) The natural gas dual fuel vehicle must be designed such that gasoline is used only when the natural gas tank is effectively empty, except for limited use of gasoline that may be required to initiate combustion.

(k) *Alternative in-use weighting factors for dual fuel model types.* Using one of the methods in either paragraph (k)(1) or (2) of this section, manufacturers may request the use of alternative values for the weighting factor F in the equations in paragraphs (j)(2)(vi) and (vii) of this section. Unless otherwise approved by the Administrator, the manufacturer must use the value of F that is in effect in paragraphs (j)(2)(vi) and (vii) of this section.

(1) Upon written request from a manufacturer, the Administrator will determine and publish by written guidance an appropriate value of F for each requested alternative fuel based on the Administrator's assessment of real-world use of the alternative fuel. Such published values would be available for any manufacturer to use. The Administrator will periodically update these values upon written request from a manufacturer.

(2) The manufacturer may optionally submit to the Administrator its own demonstration regarding the real-world use of the alternative fuel in their ve-

hicles and its own estimate of the appropriate value of F in the equations in paragraphs (j)(2)(vi) and (vii) of this section. Depending on the nature of the analytical approach, the manufacturer could provide estimates of F that are model type specific or that are generally applicable to the manufacturer's dual fuel fleet. The manufacturer's analysis could include use of data gathered from on-board sensors and computers, from dual fuel vehicles in fleets that are centrally fueled, or from other sources. The analysis must be based on sound statistical methodology and must account for analytical uncertainty. Any approval by the Administrator will pertain to the use of values of F for the model types specified by the manufacturer.

[75 FR 25714, May 7, 2010, as amended at 76 FR 39567, July 6, 2011; 77 FR 63184, Oct. 15, 2012]

**§ 600.511-08 Determination of domestic production.**

(a) Except with advance approval of the Administrator, an automobile shall be considered domestically produced in any model year if it is included within a domestically produced car line (car line includes station wagons for purposes of this paragraph), unless the assembly of such automobile is completed in Canada or Mexico and such automobile is not imported into the United States prior to the expiration of 30 days following the end of the model year. For purposes of this paragraph a car line will be considered domestically produced if the following ratio is less than 0.25:

(1) The sum of the declared value, as defined in § 600.502, of all of the imported components installed or included on automobiles produced within such a car line within a given model year plus the cost of transportation and insuring such components to the United States port of entry, the Mexican port of entry (when paragraph (b)(3) of this section applies), or the Canadian port of entry but exclusive of any customs duty, divided by

(2) The cost of production, as defined in § 600.502, of automobiles within such car line.

(b) For the purposes of calculations under this subpart with respect to